Case study

Health

AN ECOSYSTEM APPROACH

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From Forests to Fields in Côte d'Ivoire

Improve resource management, improve human health

What happens when policies and programs to promote economic growth unexpectedly wreack havoc with the environment and people's health? In Côte d'Ivoire, researchers supported by the International Development Research Centre (IDRC) are looking at ways to reduce the harmful health impacts of unbridled agricultural development and of a large hydroelectric dam. But there's a twist — rather than focusing on health services, they are trying to improve people's health by better managing the local resource base.

For most of its history, the town of Buyo has been an isolated backwater in the humid equatorial forests of southwestern Côte d'Ivoire. In the late 1960s, the national government launched an ambitious plan to develop the region's rich resource base. The key economic drivers were policies and programs to promote intensive agriculture, geared largely to export markets, and a hydroelectric dam built in 1980 on the Sassandra River. Today, Buyo is part of Côte d'Ivoire's "new coffee and cacao belt" and a magnet for economic migrants from across Côte d'Ivoire and neighbouring West African states. Most come in search of land on which to grow cash crops for export or produce for the local market. Some find work in forestry operations or in the thriving fishery that has blossomed on Lac Buyo, the name given to the reservoir behind the hydroelectric dam. The flood of immigrants to Buyo and surrounding villages has pushed the population from 7,500 inhabitants in 1972 to more than 100,000 individuals today.

The price of progress

Buyo's rapid transformation from forests to fields has come at a price. Across the region, people and communities are struggling to come to grips with the magnitude of economic, environmental, and social changes. A 1996 study by a team of Ivorian researchers, led by Dr Pascal Houénou from the University of Abobo-Adjamé, catalogued a litany of ongoing problems, many of which stem from the success of regional development plans.

CIDA: Roger LeMoyne

When it comes to the sale and use of agrochemicals, it is anarchy, says Ivorian researcher, Dr Pascal Houénou.

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"Unfortunately," says Houénou, "the agricultural policies put in place have translated into a veritable race against the clock as people clear as much land as possible to secure ownership and title in order to bequeath it to their families."

Figures show that land cleared for coffee and cacao production has grown a hundred-fold since 1975. Palm oil and rubber production has also expanded. Land is now a highly marketable commodity subject to speculation and disputes, especially between the region's original inhabitants, the Kouizé, Bété, and Gnanboua, and new migrants to the region. A presidential dictum stating that "the land will belong to he who exploits it" has done little to ease tensions or promote integration. For the most part, Buyo neighbourhoods and the surrounding villages remain ethnic enclaves. Economic development has also left its mark on the environment. As savannas replace forests, less rain falls and biodiversity disappears. The heavy use and misuse of fertilizers and pesticides on crops is also affecting the quality of water in Lac Buyo and its watershed.

"When it comes to the sale and use of agrochemicals, it is anarchy," says Houénou. "There is a general disregard for application rates, user protection, and the safe handling and stockpiling of containers. This poses a real health hazard."

Pesticides such as DDT, lindane, aldrin, and heptachlor that are banned or tightly regulated elsewhere in the world are in common use here. In warm aquatic systems, like Lac Buyo, these pollutants are easily transformed into other compounds that can readily enter the food chain. Samples taken from fish confirm the presence of the toxins and clearly show that levels of contamination are increasing as these compounds are carried up the food chain.

Water quality is further compromised by the lack of sanitation and waste disposal facilities throughout the area. "Lac Buyo has become a dump," says Houénou.

Water hyacinth and algae thrive on the nitrates and phosphorus flushed into the local watershed from fields, villages, and the town of Buyo. They are choking waterways and reducing the dissolved oxygen content of the water. This, in turn, is affecting the mix of fish species present in the lake and surrounding rivers.

The effects of all these changes on the local population are noticeable. Water-borne diseases, such as malaria and diarrhea, and respiratory ailments are on the rise. Malnutrition and poverty are widespread despite decades of economic growth.

IDRC: Denis Marchand

Cocao is king in Côte d'Ivoire and, along with coffee growing, it has transformed Buyo and the surrounding environment — but at what price?

The search for solutions begins

Finding solutions to the health problems he has chronicled is the goal of a follow-up study led by Houénou and supported by Canada's International Development Research Centre (IDRC). This time around Houénou and the team of researchers he has assembled will use an "ecosystem approach to human health." The goal is to find ways of managing the local environment to improve its health and the health of the people living in it. Pioneered in communities along the tributaries of Brazil's Amazon River, the approach is gaining acceptance as a more holistic approach to human health and well-being — one that is well-suited to the needs of developing countries.

The key to the "ecosystem approach" is a broader understanding of the role social, cultural, economic, and environmental factors play in the health of the local population and how those factors interact. The active involvement of the community is therefore critical to its success.

"In any research that aims to ensure a better standard of living for the local population, the viewpoint of community members must be taken into account so as to capture their perception of their own environment and to identify their priorities," says Houénou.

The risk, as the research team found out, is that community priorities and motivation may be very different from those of the researchers. In a workshop that brought together Houénou's research team, administrative authorities, nongovernmental organizations, and village leaders — as well as men, women, and children from across the study area — community priorities were set squarely on infrastructure improvement: electricity, better roads, more clinics and schools, wells and boreholes that were maintained and reliable. Topping the list was housing.

"Housing was not part of our original research problem," says Houénou, "but from a community perspective it is certainly an issue of well-being. It meant we had to work hard to communicate with the responsible authorities, local and national."

During the workshop, the group also decided to restrict the study area to Buyo and its immediate surroundings and focus more intensely on the urban, agricultural, and aquatic components of the local ecosystem. To bolster community confidence in the whole process, Houénou and his team targeted the abysmal lack of safe drinking water for more immediate and direct action. They drew on the work of a group of IDRC-supported researchers from Latin America who have perfected a kit of affordable, efficient, community-based water management technologies.

The Buyo researchers chose to pilot slow sand filters to provide potable water to households in the study area. Slow sand filters are a proven technology, are easily constructed and maintained, and effectively remove 80-90 percent of all microbiological contaminants while significantly reducing the level of heavy metals in water.

The filters are part of a larger information, education, and communication strategy designed to educate the population about water-borne diseases and some of the other problems associated with the way water resources are managed. Researchers will also examine how social and economic practices contribute to the problem.

Houénou is the first to admit that community participation can complicate the research process. But it can also pay dividends, he says. "We can use community know-how and expertise to blend with the results of our research. The two work in synergy to produce concrete changes within the community. This is the essence of action research."

IDRC: Neil McKee

Policies promoting coffee and cacao cash cropping in Côte d'Ivoire's southwest triggered a landrush that sparked ethnic tensions.

IDRC: S. Colvey

On the research side, health professionals, social scientists, soils scientists, chemists, biologists, a toxicologist, and a group charged with transferring technology to the local population will all contribute to the pool of data being collected. Before starting their work, however, the scientific team first had to define a common research question and common strategy for tackling it. This transdisciplinarity is another key element in the ecosystem approach, which often proves challenging for scientists entrenched within a single discipline.

"Researchers have to overcome some of their habits to go beyond their own sense of scientific security," says Houénou. "Most are not used to working with researchers from other disciplines. But when they get talking you can see them asking different kinds of questions."

Having to include other perspectives when analyzing a problem broadens the scope of scientific enquiry and changes the underlying research question. It also requires regular meetings in which researchers share results, exchange views, and fine tune approaches. The outcome is a better understanding of the big picture and the many factors at play, which is validated by the community during regular meetings with the research team.

This approach often unearths links or factors not evident at first glance. For example, seasonal changes in the level of water in Lac Buyo influence the way biological and chemical contaminants move through the lake. The observed effects may also change seasonally depending on how people use water at different times of the year.

Gender matters

This approach also underscores the "gendered" aspect of resource use or misuse and any resulting health effects. A thorough gender analysis is the third and final pillar of the ecosystem approach. As an example, the greater amount of time that women and children spend indoors or around their home, compared to men, may place them at greater risk of contracting vector-borne diseases like malaria. They

IDRC: Peter Bennett

Water hyacinth grows thickly on fertilizer-laden runoff.

are often the first food source mosquitoes encounter as they emerge from the thatch or eaves of houses to feed in the evenings. Finally, power relations exist within communities and households. These are often expressed in the different opportunities afforded boys and girls, men and women.

In Buyo, the health effect on women and young children of exposure to pesticides and other agrochemicals has been given priority. Testing mothers' milk and hair for pollutants will help quantify that risk. Socioeconomic factors, such as the use of discarded pesticide containers as water carriers or a diet rich in fish, will be examined to see if and why certain populations are at greater risk.

Power relations are also reflected in ethnic conflicts in Buyo. Access to and use of resources often depend on ethnic affiliations. Understanding how this functions is important in developing resource management strategies that are sustainable and equitable.

Implementing change

Once the researchers have completed their analysis, a clearer picture of the determinants of people's health will emerge. Then will come the work of devising solutions to the problems. Change is never easy, but communities that have contributed to analyzing the problems will be more likely to adopt proposed solutions. Knowing what factors affect their health can help them make informed decisions about how best to protect themselves and their environment. This is a vital first step in promoting community well-being.

This *Case Study* was written by Kevin Conway, a writer in IDRC's Communications Division.

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Ecosystem Approaches to Human Health

Human health and well-being are intimately tied to the health of the ecosystems that sustain life. Yet the potential for improving health by better managing the local environment is an avenue rarely explored in mainstream health programing. Through its Ecosystem Approaches to Human Health (Ecohealth) Program Initiative, IDRC aims to identify the web of economic, social, and environmental factors that influence human health. Communities can then use this knowledge to better manage ecosystems and improve the health of both people and the ecosystem.

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The International Development Research Centre (IDRC) is a public corporation created by the Parliament of Canada in 1970 to help researchers and communities in the developing world find solutions to their social, economic, and environmental problems. Support is directed toward developing an indigenous research capacity to sustain policies and technologies developing countries need to build healthier, more equitable, and more prosperous societies.

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